

CLAIMS

1. A constant current driving unit for constant current driving a plurality of series-connected devices by a pulse width modulating constant current driving circuit, comprising:

a bypass circuit including a plurality of thyristors each connected in parallel with each of said series-connected devices;

said bypass circuit including a gate potential setting circuit for affording to said thyristors a gate potential value such that, when the series-connected devices are operating as normally, the thyristors are in the off-state, said gate potential setting circuit affording to said thyristors another gate potential value such that, when the devices are in the open state, the thyristors will be in a turned-on state.

2. The constant current driving unit according to claim 1 wherein a resistor is connected in parallel with a switching device for pulse width modulation provided to said pulse width modulating constant current driving circuit so that the current for maintaining the turn-on state of a turned-on thyristor in the turned-on state will be caused to flow through said resistor.

3. The constant current driving unit according to claim 1 wherein

said plural series-connected devices are light emitting diodes.

4. A backlight light source unit for illuminating a display panel from a back side thereof, comprising

a plurality of light-emitting diodes connected in series with one another; and

a bypass circuit including a plurality of thyristors each connected in parallel with each of said series-connected light emitting diodes;

said bypass circuit including a gate potential setting circuit for affording to said thyristors a gate potential value such that, when the series-connected light emitting diodes are operating as normally, the thyristors are in the off-state, said gate potential setting circuit affording to said thyristors another gate potential value such that, when the light emitting diodes are in the open state, the thyristors will be in a turned-on state.

5. The backlight light source unit according to claim 4 wherein a resistor is connected in parallel with said switching device for pulse width modulation provided to said pulse width modulating constant current driving circuit so that the current for maintaining the turn-on state of a turned-on thyristor in the turned-on state will be caused to flow through said resistor.

6. A color liquid crystal display apparatus comprising

a light transmitting color liquid crystal display panel including a color filter and a backlight light source unit for illuminating said light transmitting color liquid crystal display panel from the back side thereof, wherein

said backlight light source unit includes

a plurality of light-emitting diodes connected in series with one another; and

a bypass circuits each being a thyristor and each being connected in parallel with each of said series-connected light emitting diodes;

said bypass circuit including a gate potential setting circuit for affording to said thyristors a gate potential value such that, when the series-connected light emitting diodes are operating as normally, the thyristors are in the off-state, said gate potential setting circuit affording to said thyristors another gate potential value such that, when the light emitting diodes are in the open state, the thyristors will be in a turned-on state.

7. The color liquid crystal display apparatus according to claim 6 wherein a resistor is connected in parallel with a switching device for pulse width modulation provided to said pulse width modulating constant current driving circuit so that the current for maintaining the turn-on state of a turned-on thyristor in the turned-on state will be caused to flow through said resistor.